Abs Jour : Ref Zhur - Khimiya, No. 8, 1957, 26694.

methyl-4-ethinylpiperidol-4 (XVII), dimethyl- (XVIII) and methylethyl- (XIX) 3-diethylamino-propinyl-1-carbinol, dimethyl-3-piperidino-propinyl-1-carbinol (XX), 1-(3-diethylamino-propinyl-1)-cyclohexanol-1 (XXI) and diiso-propylethinylcarbinol (XXII). 6 g of I is boiled with the solution of 20 g of dry HCl in 90 mlit of CH_3OH two hours, after having the solvent distilled off in vacuum, 150 mlit of water is added to the residue, the mixture is saturated with potassium and $HC\equiv CCH(CH_3)O-(CH_2)_2COOCH_3$, and extracted with ether, the yield is 5.7 g, boil. p is 85 to 86°/15 mm, $n^{20}D = 1.4326$, $d_4^{20} = 1.0005$. Other methyl

Abs Jour : Ref Zhur - Khimiya, No. 8, 1957, 26694.

ethers were prepared in an analogous way (the initial substance, its amount in g, the yield of the corresponding methyl ether in g, its boiling point in °C/mm, $n^{20}D$ and d_4^{20} are enumerated: II - 10, 11, 95 to 96/14, 1.4347, 0.9822; III - 11.5, 12.9, 104 to 105/12, 1.4362, 0.9678; IV - 8, 6.3, 95 to 96/10, 1.4345, 0.9646; V - 13.7, 16.6, 83 to 84/12, 1.4290, 0.9698; VI - 15.1, 12.6, 91 to 92/11, 1.4338, 0.9712; VII - 10, 6.9, 104 to 105/12, 1.4374, 0.9594; VIII - 10.5, 6.9, 115 to 116/3, 1.4423, 0.9405; IX - 12, 8.7, 146 to 148/4, 1.4474, 0.9164; X - 10, 5.4, 105 to 107/13, 1.4402, 0.9171; XI - 10, 3.8, 125 to 127/12,

Abs Jour : Ref Zhur - Khimiya, No. 8, 1957, 26694.

1.4424, 0.9537; XIII - 17.5, 18.9, 101 to 102/2.5, 1.4652, 1.0262; XIV - 10, 7.1, 107 to 108/2.5, 1.4642, 1.0079; XV - 12, 13.1, 150 to 152/4, 1.4887, 1.0465; XVI - 10.5, 8.6, 119 to 120/2.5, 1.4647, 1.0516; XVII - 10, 9.1, 123 to 125/2, 1.4692, 1.0252; XVIII - 13, 12.4, 116 to 118/2, 1.4504, 0.9528; XXI - 13, 12.8, 155 to 157/3, 1.4744, 0.9894. 8 g of VII and a solution of 19 g of HCl in 100 ml it of CH_3OH are left to stay 60 hours at about 20°, $HC{\equiv}CC(CH_3)(n\text{-}C_3H_7)O(CH_2)_2COOCH_3$ is obtained, yield 8.2 g. Methyl ethers of VIII, yield 8.4 g (from 8 g of VIII), from 8 g of IX - 8.5 g, from 8.5 g of X - 9 g, from 8 g of XI - 7.6 g, from 8 g of XVI - 7.5 g, as well as others are prepared by this method (the initial substance, its amount in g, the yield and the constants

NOVIKOV, S.S.; SHVEYKHGEYMER, G.A.

Synthesis of aromatic nitro ketones and nitro nitriles by the Wittig reaction. Izv. AN SSSR.Otd. khim. nauk no.11:2061-2063 N '60. (MIRA 13:11)

1. Institut organicheskoy khimii im.N.D.Zelinskogo AN SSSR.
(Ketones) (Nitriles)

SHVEYKIN, B.K.; PINSKIY, A.Yo. [Pins'kyi, O.IU.]

Production of cotton-nylon blend yarn in the Kiev Cotton Spinning Factory. Leh. prom. no.3:47-49 Jl-S '65. (MIRA 18:9)

SHVEYKIN, G. P.

GEID, P. V. and SHVEYKIN, G. P.
"Sverdlovsk Polytechnic Institute

"Kinetics of the Niobium Pentoxide Reduction in the Vacuum."

paper presented at Second Symposium on the Application of Vacuum Metallurgy.
1-6 July 1957 Moscow

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SOV/81-59-13-45032

Translation from: Referativnyy zhurnal, Khimiya, 1959, Nr 13, pp 43 - 44 (USSR)

AUTHOR: Shveykin, G.P.

TITLE: The Thermodynamic Analysis of the Equilibrium in the Niobium-Oxygen-Carbon System

PERIODICAL: Tr. in-ta khimii. Ural'skiy fil. AS USSR, 1958, Nr 2, pp 45 - 49

ABSTRACT: The thermodynamic analysis of the following systems has been carried out: $Nb_2O_5 + C = 2NbO_2 + CO$ (1), $NbO_2 + S = NbO + CO$ (2), $NbO + 2C = NbC + CO$ (3), $NbO + C = NB + CO$ (4), $NbO + NbC = 2Nb + CO$ (5), $C + CO_2 = 2CO$ (6). Due to the absence of data on the temperature dependences of the heat capacities of most niobium compounds, the calculation was carried out by the approximate entropy equation. It was assumed in the calculation that phases of variable composition are not formed in the reduction process of niobium oxides by carbon. On the basis of literature data the changes in the isobaric-isothermal potentials of the reactions were calculated. $\Delta Z_1 = 41,664 - 38.86T$, $\Delta Z_2 = 61,164 - 45.26T$, $\Delta Z_3 = 60.634 - 41.60T$, $\Delta Z_4 = 89,634 - 42.00T$, $\Delta Z_5 = 100,040 - 43.40T$, $\Delta Z_6 = 40,800 - 41.7T$. The

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The Thermodynamic Analysis of the Equilibrium in the Niobium-Oxygen-Carbon System

temperature dependence of the reaction equilibrium constants is calculated by the equation $lgK_p = - \Delta Z/4.575T$. The dependence of the logarithm of the partial CO pressure on the temperature for the reactions (1) - (5) is represented in the graph. The CO_2 percentage in the gaseous phase is calculated for reactions (1) - (5) by the found values of the equilibrium constants. From the thermodynamic calculations it is evident that the conditions of reducing Nb_2O_5 by carbon (temperature, equilibrium pressure of CO and the percentage of CO_2 in the gaseous phase) depend strongly on the composition of the intermediate products. Reaction (1) proceeds at a lower temperature than reactions (2) and (3). Reaction (4) is thermodynamically in more favorable conditions compared to reaction (5). Considering that reaction (3) proceeds together with reaction (2), the most probable reaction with the formation of niobium metal is reaction (5), taking place at 2,030°C and atmospheric pressure. At lower temperatures this reaction takes place only in vacuum.

A. Zolotarevskiy -/

67522

5.2200(c) SOV/81-59-14-48976

Translation from: Referativnyy zhurnal, Khimiya, 1959, Nr 14, p 88 (USSR)

AUTHOR: Shveykin, G.P.

TITLE: On the Intermediate Compounds of Niobium in the Reduction of Niobium Pentoxide by Carbon

PERIODICAL: Tr. in-ta khimii. Ural'skiy fil. AS USSR, 1958, Nr 2, pp 51 - 56

ABSTRACT: A quantitative roentgenographic analysis of the products of Nb_2O_5 reduction by carbon in a vacuum at 1,200°C was carried out. It is shown that under the given conditions NbO_2 and the carbide NbC_x are formed as intermediate products. It is assumed that the formation of Nb oxycarbide is possible. It was established that the interaction between NbO_2 and NbC_x is observed at 1,450 - 1,500°C in a vacuum, with the formation of a solid solution having the approximate composition $NbC_x'O_y'$. The existence of Nb_2O_3, $Nb_{0.75}O$ (Nb_3O_4) is not confirmed in the present work.

Author's summary.

Card 1/1

SHVEYKIN, G.P.

Kinetics of the reduction of niobium pentoxide by carbon in a vacuum. Trudy Inst. khim. UFAN SSSR no.2:57-62 '58. (MIRA 12:12)

(Niobium oxide) (Carbon)

SOV/78-3-11-2/23

AUTHORS: Alyamovskiy, S. I., Shveykin, G. P., Gel'd, P. V.

TITLE: On Low Niobium Oxides (O nizshikh okislakh niobiya)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 11, pp 2437-2444 (USSR)

ABSTRACT: Experiments were carried out on the possibility of the existence of low niobium oxides. Most pure niobium and oxides produced from it by means of an annealing of the metal at 800-900°C served as initial materials. The following preparations were used: Nb_2O_5, $Nb_2O_{4,9}$ NbO_2, Nb_2O_3, Nb_3O_4, NbO, Nb_2O. The X-ray structure investigations of the phases of the system Nb-O produced by the reduction of Nb_2O_5-Nb-mixtures at a ratio of Nb : Nb_2O_5 = 3 : 1 were carried out at 1200°, 1580°, and 1650°C. The results showed that the following phases exist at the temperatures investigated: Nb_2O_5, NbO_2, NbO, and Nb. The phase NbO with the lattice constant a = 4430 X.U. is not produced in the system Nb-O. It was found that a phase with complex body-centered cubic lattice with the lattice constant

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On Low Niobium Oxides

a = 4201,3 X.U. exists at the equilibrium between the metal and the oxides. The low oxides Nb_2O, Nb_4O, Nb_3O_7, Nb_3O_5, Nb_2O_3, and Nb_3O_4 do not exist in the case of an interaction between niobium oxide and niobium, and in the presence of carbon. There are 2 figures, 1 table, and 24 references, 5 of which are Soviet.

SUBMITTED: October 24, 1957

SOV/180-59-1-8/29

AUTHORS: Gel'd, P.V. and Shveykin, G.P. (Sverdlovsk)

TITLE: Some Peculiarities of the Carbon-Thermic Reduction of Niobium Pentoxide (Nekotoryye osobennosti ugletermicheskogo vosstanovleniya pyatiokisi niobiya)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 1, pp 44-49 (USSR)

ABSTRACT: It has been shown (Refs 1,2) that the direct production of niobium by reaction of the pentoxide with carbon is not suitable technically. A better method, probably, is to cause the pentoxide to react with carbon to give the carbide which is then heated with a further portion of pentoxide to give the metal. To provide technically useful information on the latter reactions the authors have studied the reaction kinetics. The Nb_2O_5, of 97.4 - 99.8% purity, was prepared in various ways (Table 1), the monoxide and dioxides were prepared by vacuum fusion of pentoxide-carbide mixture. The carbon was in the form of acetylene black, graphite, coaltar pitch and its coking products. The reagents were mixed, finely ground, pressed into briquettes and heated in vacuum with continuous weighing. Considerable differences were

Card 1/3

Some Peculiarities of the Carbon-Thermic Reduction of Niobium Pentoxide

found in the percent reduction vs. time (min) curves (Fig 1) for the various preparations of Nb_2O_5, previous heat treatment being an important factor since it alters the phase composition (as confirmed by an X-ray structural investigation carried out by S.I. Alyamovskiy). The T-phase, stable below 900°C, was found to be the most reactive as shown by the percent reduction vs. time (min) curves in Fig 2, of which curves 11 and 12 correspond to niobium hydroxide calcining temperatures of 550 and 530°C respectively, 13 and 14 to 800°C, 15 and 16 to 900°C, 17, 18 and 19 to 1000°C and 20 to 1200°C. The curves show that the attainment of the NbO_2 stage does not correspond to slower reaction, and the authors attribute this to the disruption of grains in the first stage. The reduction proceeded rapidly at a pressure of 10^{-1}mm Hg, and even at 3-4 mm Hg. The presence of small amounts of potassium salts greatly accelerated the reduction, as did the use of a more finely divided reducing agent (Fig 4). Examinations were carried out on partially-reduced products: only Nb_2O_5 NbO_2 and NbC_x ($x = 0.86 - 0.89$) were found after reduction at 1050-1250°C, similar

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Some Peculiarities of the Carbon-Thermic Reduction of Niobium Pentoxide

conclusions being reached from other experiments. The authors recommend the technical adoption of a process in which the first stage is the production of a dioxide-carbide mixture from the low-temperature modification of Nb_2O_5 rather than the intermediate-carbide process. The reaction of a synthetic carbide (11.4% C) with oxide was found to be very slow below 1250°C; on raising the temperature to 1350, 1500 and 1600°C successive stages of reduction are reached (Fig 5). Further tests showed that at 1750-1800°C and a pressure of 5×10^{-3} mm Hg, 98.8 - 99.8-% Nb sponge could be obtained by direct reduction of Nb_2O_5 with coaltar pitch, from an oxide-carbide mixture or by reduction of Nb_2O_5 with the highest carbide of niobium. The advantages of the second method were confirmed in larger-scale (up to 3 kg of niobium) experiments. There are 5 figures, 3 tables and 11 references, 9 of which are Soviet, 1 English and 1 German.

Card 3/3

SUBMITTED: June 30, 1958

ALYAMOVSKIY, S.I.; GEL'D, P.V.; SHVEYKIN, G.P.

Niobium carbides. Trudy Ural. politekh. inst. no.92:125-134 '59.
(MIRA 13:12)

(Niobium carbide)

PHASE I BOOK EXPLOITATION SOV/4548

Akademiya nauk SSSR. Komissiya po fiziko-khimicheskim osnovam proizvodstva stali

Primeneniye vakuuma v metallurgii. (Use of Vacuum in Metallurgy) Moscow, Izd-vo AN SSSR, 1960. 334 p. Errata slip inserted. 4,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni A.A. Baykova. Komissiya po fiziko-khimicheskim osnovam proizvodstva stali.

Resp. Ed.: A.M. Samarin, Corresponding Member, Academy of Sciences USSR; Ed. of Publishing House: G.M. Makovskiy; Tech. Ed.: S.G. Markovich.

PURPOSE: This collection of articles is intended for technical personnel interested in recent studies and developments of vacuum steelmaking practice and equipment.

COVERAGE: The book contains information on steel melting in vacuum induction furnaces, and vacuum arc furnaces, reduction processes in vacuum, and degassing of steel and alloys. The functioning of apparatus and equipment, especially vacuum furnaces and vacuum booster pumps is also analyzed. Personalities are mentioned in connection with some of the articles and will appear in the Table of Contents. Three articles have been translated from English. Some of the

Card 1/9

SHVEYKIN, G.P.; GEL'D, P.V.; LYUBIMOV, V.D.

Effect of the recrystallization of niobium pentoxide on the rate of its deoxidation. Izv. vys. ucheb. zav.; tsvet. met. 3 no.3:120-125 '60. (MIRA 14:3)

1. Ural'skiy politekhnicheskiy institut.
(Niobium oxide) (Crystallization)

S/136/61/000/004/003/006
E021/E135

AUTHORS: Shveykin, G.P., and Gel'd, P.V.

TITLE: The Production of Metallic Niobium from an Oxide-Carbide Mixture

PERIODICAL: Tsvetnyye metally, 1961, No. 4, pp. 39-42

TEXT: The first stage of the two-stage process for the thermal production of niobium is the production of niobium carbide from niobium pentoxide and carbon:

$$Nb_2O_5 + 5C = 1.42NbC_{0.8} + 0.573NbO_2 + 3.854\ CO$$

Earlier work of the authors related to the kinetic characteristics of the reaction at low pressures (Refs. 3 and 4) and to X-ray structural investigations (Ref.5). The present article gives results of studies of the reaction at atmospheric pressure and the composition of the intermediate products in conditions used in practice and also results on experiments of the production of metallic niobium. The starting materials were niobium pentoxide and acetylene black. Experiments were carried out in a resistance

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S/136/61/000/004/003/006
E021/E135

The Production of Metallic Niobium from an Oxide-Carbide Mixture

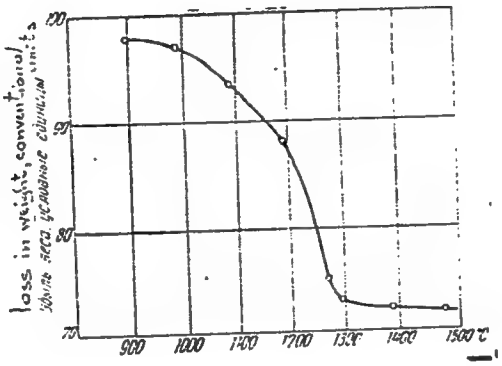
furnace. The kinetics were followed by the decrease in weight. Metallic niobium was prepared in a laboratory vacuum furnace. The effect of temperature (°C) on the kinetics of the reaction at atmospheric pressure [decrease in weight of the charge (niobium pentoxide and carbon) in relative units] is shown in the figure. The reaction begins at 900 °C. The loss in weight increases with increasing temperature up to 1300 °C. The phase analysis of the products of reduction are given in the table. For the preparation of metallic niobium, niobium pentoxide was added (5% excess). The charge was carefully mixed and 9% solution of rubber in benzene was added. The mixture was pressed into mouldings with 4.5 T/cm^2 and they were dried at 120 °C. It was found necessary to give a preliminary heat-treatment to the mouldings at 1350-1400 °C in an argon atmosphere to give sufficient strength and conductivity. The samples could then be heated by high frequency induction or by passing an electrical current through them. By heating to 1450-1500 °C in vacuo, holding at this temperature for 30 minutes and increasing the temperature to 1750 °C, porous mouldings of

Card 2/4

The Production of Metallic ....

metallic niobium containing 99.4-99.8% Nb, 0.5-0.1% C and less than 0.1% O_2 were obtained.
There are 1 figure, 1 table and 6 references: 5 Soviet and 1 English.

Figure



Card 3/4

S/078/63/008/003/011/020
B117/B186

AUTHORS: Shveykin, G. P., Gel'd, P. V., Alyamovskiy, S. I.

TITLE: Conditions for the formation of niobium oxycarbides

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 8, no. 3, 1963, 689-696

TEXT: The phase composition of the intermediates formed during the reaction between niobium oxides and carbides at different temperatures and pressures was studied by x-ray diffraction analysis. To produce specimens, mixtures of oxides and carbide were briquetted (at 2.5 - 3 tons/cm^2) and sintered at 1400-1900°C in vacuo ($\sim 10^{-3}$ mm Hg) or in pure argon ($\sim$1 atm) for 10-225 min. The specimens made from the lowest oxides and carbide sintered in vacuo contained no oxycarbide. In the specimens produced in argon, however, an oxycarbide phase was formed due to high partial carbon oxide pressure near the reaction zone. Carbon atoms enter the niobium monoxide lattice to a limited extent or not at all. The formation of niobium oxycarbides is due to penetration of oxygen into the carbide lattice. In the Nb - C - O system, oxycarbides

Card 1/2

SHVETKIN, G.P.

Effect of porousness on the refining of high melting metals during their high-temperature sintering and preparation in a vacuum. Poroshk. met. 3 no.3:12-17 My-Je '63. (MIRA 17:3)

1. Institut khimii Ural'skogo filiala AN SSSR.

SHVEYKIN, G. P.
TITLE: Seminar on refractory metals, compounds, and alloys (Kiev, April 1963).
SOURCE: Atomnaya energiya, v. 15, no. 3, 1963, 266-267.

ACCESSION NR: AP3008085

Ye. I. Yelagina, N. Kh. Abrikosov. Synthesis and investigation of rhenium silicide.

G. P. Shveykin and others. Kinetics of niobium oxicarbide decomposition in vacuum, interaction of niobium and carbon monoxide, etc., in connection with the development of the carbothermal method of extraction of niobium from its oxides.

L. A. Nisel'son and others. Obtaining niobium, tantalum, and their alloys by reduction of gaseous chlorides with hydrogen on a heated surface.

G. V. Samsonov, S. N. L'vov, V. N. Paderno. Obtaining ZrC, HfC, NbC, and TaC solid solutions by hot compacting of mixtures of oxides with carbon.

V. F. Funke, V. I. Pshenichny*y. Study of conditions of obtaining TiC, ZrC, and VC from oxides.

V. N. Bondarev. Investigation of synthesis of transition-metal

Card 4/11

AUTHOR: [illegible], G. P.
TITLE: Seminar on refractory metals, compounds, and alloys (Kiev, April 1963).
SOURCE: Atomnaya energiya, v. 15, no. 3, 1963, 266-267.

ACCESSION NR: AP3008085

S. S. Ordan'yan, A. I. Avgustinnik, V. S. Vidergauz. The ZrC-Mo phase diagram at temperatures above 2500C.

L. B. Dubrovskaya, G. P. Shveykin. Phase diagram of the Ta-C system at temperatures above 2500C.

Yu. N. Vil'k, R. G. Avarbe, and others. The NbC-W interaction at temperatures above 2500C.

L. M. Katanov. Investigation of the Cr_2C_3-Fe, Cr_7C-Fe, and Cr_2C-Ti systems at temperatures below 2500C.

Yu. B. Kuz'ma, Ye. I. Glady*shevskiy, and Ye. Ye. Cherkashin. Physicochemical investigation of the Nb-Co-Si system.

N. N. Kolomy*tsev, N. V. Moskaleva. Phase composition of Mo-Ni-B alloys.

Ye. I. Glady*shevskiy and others. Interaction between group 4a and

Card 6/11

S/080/63/036/002/006/019
D204/D307

AUTHORS: Shveykin, G. P. and Lyubimov, V. D.

TITLE: Kinetics of the interaction of niobium carbides and oxides in vacuum

PERIODICAL: Zhurnal prikladnoy khimii, v.36, no. 2, 1963, 299-307

TEXT: The present article is a continuation of earlier work (Izv. AN SSSR, OTN, Metallurgiya i toplivo, 1, 45 (1959); Primeneniye vakuuma v metallurgii (Application of vacuum in metallurgy), Sb. st. pod red. L. A. Samarina, IMET im. A. A. Baykova, AN SSSR, M. (1960); ZhPKh, 35, 9 (1962)), which showed that Nb is conveniently obtained by (1) low temperature reduction of Nb_2O_5 with C (or rather CO) to NbC, $NoC_{0.8}$, and NbO_2, followed by (2) interaction of these oxides and carbides to Nb + CO; mechanism of stage (1) being often similar to that of the reduction of Fe, Cu etc. oxides. To study the mechanism of stage (2), in the present work the authors investigated the reactions

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S/080/63/036/002/006/019
D204/D307

Kinetics of the ...

$$NbC + 2NbO_2 = 3NbO + CO \quad (a)$$

$$Nb_2C + NbO = 3Nb + CO \quad (b)$$

$$5NbC + NbO_2 = 3Nb_2C + CO \quad (c)$$

Particle size was either <0.075 mm or between 0.075 and 0.105 mm. The reactants were bonded with glycol, pressed into 12 mm dia x 10 mm long cylinders and dried at 180°C. Reactions were studied in a carbon furnace, at 1400 - 1700°C, and 1.4 - 3 x 10^{-4} torr. Reactions (a) and (b) proceeded parabolically up to ~70% reduction, the energies of activation being 86.2 kcal/mole ((a), 40 - 50% reduction) and 41.5 - 89.5 kcal/mole ((b) 5 - 15% reduction). The rates (particularly of (b)) were affected by particle size and also depended on the degree of pressing and the rate at which CO was removed from the system. The mechanism is discussed; it is believed

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that the greatest kinetic difficulties occur during the formation of metallic Nb. Diffusion processes, sinterability of the initial charge, and removal of gaseous products play an important part in these reactions. There are 5 figures.

SUBMITTED: October 5, 1961

ALYAMOVSKIY, S.I.; SHVEYKIN, G.P.; GEL'D, P.V.

Oxidation of niobium and of its lower carbide. Zhur. neorg. khim. 8 no.8:2000-2001 Ag '63. (MIRA 16:8)

(Niobium carbides) (Oxidation)

ACCESSION NR: AP4015113 S/0136/64/000/002/0082/0083

AUTHORS: Gaydukov, G.V.; Shveykin, G.P.; Alyamovskiy, S.I.

TITLE: Reducing the waste products of niobium-tungsten alloy

SOURCE: Tsvetny*ye metally*, no. 2, 1964, 82-83

TOPIC TAGS: niobium, niobium alloy , arc smelting, shavings, vacuum treatment, sodium fluoride, selective solvent, nitric acid, ferroniobium, permanent electrode, tungsten electrode, lattice spacing, hydration method

ABSTRACT: The waste products remaining after the mechanical processing of niobium and its alloys, such as shavings, chips, etc., can be reduced by the hydration method followed by sintering. But the resulting metal is porous and requires further smelting. This investigation, therefore, deals with the possibility of purifying the waste products of niobium-tungsten alloys by chemical methods to producing specified-quality ingots by way of arc smelting and thermal treatment of the alloys in a vacuum. It appears that a pre-

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ACCESSION NR: AP4015113

liminary chemical processing of the waste products makes it possible to eliminate the oxidized layer of shavings as well as the possible mechanical impurities. A study of the relationship between the shavings' dissolving speed and time at a temperature of 60 C revealed that the initial dissolving speed is the fastest for the shavings containing a large quantity of impurities, but after the first 5-6 minutes it is reduced to below the dissolving speed of similar shavings containing a large quantity of the oxide phase. The physico-chemical properties (hardness, plasticity, microstructure and lattice spacing) of the alloys made from the shavings processed by chemical or vacuum methods were proved to correspond to the properties of standard alloys. Orig. art. has: 1 table.

ASSOCIATION: None

SUBMITTED: 00	DATE ACQ: 12Mar64	ENCL: 00
SUB CODE: ML, CH	NO REF SOV: 001	OTHER: 000

Card 2/2

L 39465-65 EPF(n)-2/EWP(k)/EWP(z)/EWA(c)/EWT(m)/EWP(b)/T/EWP(e)/EWP(t) Pr-4/ Pu-4 IJP(c) JD/JG

ACCESSION NR: AP4047878 S/0279/64/000/005/0137/0141

AUTHOR: Lyubimov, V.D. (Sverdlovsk); Gel'd, P.V. (Sverdlovsk); Shveykin, G.P. (Sverdlovsk)

TITLE: Self-diffusion of niobium in monocrystalline and fused samples

SOURCE: AN SSSR. Izvestiya. Metallurgiya i gornoye delo, no. 5, 1964, 137-141

TOPIC TAGS: niobium, self diffusion, diffusion rate, diffusion coefficient, monocrystalline niobium, fused niobium, porous niobium

ABSTRACT: The characteristic mass diffusion in niobium monocrystals and in fused metallic niobium samples tagged with Nb^{95} was determined by removing layers and measuring the integral activity of the remaining sample. X-rays showed the diffusion layer was monophased and contained an insignificant amount of impurities. There was little difference between the diffusion coefficients for the monocrystalline and the fused samples. D changed with temperature according to one of the following relationships:

$$D^{Nb}_{Nb.A.B} = 49 \cdot \exp\left(-\frac{115\,000}{RT}\right) \quad or \quad D^{Nb}_{Nb} = 17 \cdot \exp\left(-\frac{110\,000}{RT}\right)$$

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L 39465-65
ACCESSION NR: AP4047878

The energy of activation of the diffusion process in these compact samples was calculated: E = 110-115 kcal/g. at. The corresponding values for powdered Nb samples were determined earlier (Gel'd, P. V., Lyubimov, V. D., Izv. AN SSSR OTN, Metallurgia i topliva, 1961, No. 6, 119):

$$D^{Nb}_{Nb\,porous} = 5.10^2 \exp\left(-\frac{84000}{RT}\right),$$ and E = 84 kcal/g. at.

Thus the coefficient of diffusion is dependent on the structure of the niobium.

"The authors are very thankful to Drs. K. Schlaubitz and E. Rexer (Institute of Applied Physics of Pure Materials, Dresden) for supplying the niobium monocrystals." Orig. art. has: 3 figures, 5 equations and 1 table.

ASSOCIATION: None

SUBMITTED: 27Jun63 ENCL: 00 SUB CODE: MM

NR REF SOV: 006 OTHER: 003

Card 2/2

ACCESSION NR: AP4036970 S/0078/64/009/005/1182/1186

AUTHOR: Dubrovskaya, L. B.; Shveykin, G. P.; Gel'd, P. V.

TITLE: The Ta-Ta sub 2 O sub 5 system

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 5, 1964, 1182-1186

TOPIC TAGS: Ta Ta sub 2 O sub 5 system, lower tantalum oxide, tantalum pentoxide, sintering, metallothermal reduction, carbon reduction, high temperature Ta sub 2 O sub 5, low temperature modification Ta sub 2 O sub 5, tantalum carbide, tantalum oxychloride

ABSTRACT: The preparation of lower tantalum oxides was attempted by reduction of Ta_2O_5 with carbon, by fusion with Ta and by sintering with tantalum hydride. X-ray analysis of the metallothermal and carbon reduction products of Ta_2O_5 indicated the absence of any lower oxides in the Ta-Ta_2O_5 system above 1050C. Sintering with tantalum hydride at 1560 gave the high temperature modification of Ta_2O_5 and a solid solution of oxygen in tantalum. Carbon reduction at 1700C results in the product consisting of Ta_2O_5 and Ta_2C, formed through the intermediate tantalum oxychloride $Ta_2C_xO_y$ which is more stable below 1700C. Metallo-

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ACCESSION NR: AP4036970

graphic and x-ray analyses of tantalum melts with oxygen showed the Ta-O system has a simple eutectic fusion diagram with the eutectic point approximating the empirical "TaO" composition. Samples prepared by additional annealing for 500 hours at 1050C in a sealed quartz ampoule and subsequent water quenching did not show any changes in the phase structure. The high temperature modification of Ta_2O_5 was readily converted to the low-temperature modification by annealing below 1320C, but the low temperature could not be converted to the high temperature modification even on heating to fusion. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: None

SUBMITTED: 12Oct63 DATE ACQ: 05Jun64 ENCL: 00

SUB CODE: MM, IC NO REF SOV: 004 OTHER: 012

Card 2/2

DUBROVSKAYA, L.B.; SHVEYKIN, G.P.; GEL'D, P.V.

Phase components of the system tantalum - carbon. Fiz. met. i metalloved. 17 no.1:73-77 Ja '64. (MIRA 17:2)

1. Institut khimii Ural'skogo filiala AN SSSR i Ural'skiy politekhnicheskiy institut im. S.M.Kirova.

ACCESSION NR: AP4033403 S/0076/64/038/003/0702/0707

AUTHORS: Kornilov, A.N. (Moscow); Zaykin, I.D. (Moscow); Skuratov, S.M. (Moscow); Dubrovskaya, L.B. (Moscow); Shveykin, G.P. (Moscow)

TITLE: Standard heats of formation of tentalum carbides from Ta sub 2 C phase

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 3, 1964, 702-707

TOPIC TAGS: tantalum carbide, heat of combustion, heat of formation, Ta sub 2 C phase, impurity

ABSTRACT: The heats of combustion of tantalum carbide with $TaC_{0.455}$ (1) and $TaC_{0.507}$ (2) composition from the Ta_2C phase have been determined. The carbides had less than $5 \cdot 10^{-2}$ weight % of Sn, Cu and Mn impurities and less than $1 \cdot 10^{-3}$ weight % of Sb, Ni, Mg, Zr, Ca, Al, W, Pb, Bi and Cd impurities. The carbon content of the carbides was determined with 0.01 - 0.02 % accuracy from the content of CO_2 produced upon combustion of carbide in a stream of oxygen at 1050C. The O, N and H content was determined by the vacuum fusion method with accuracy ± 0.02 % for O and N and ± 0.001 % accuracy for H. The Nb,

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ACCESSION NR: AP4033403

Si, Ti and Fe content was determined spectrographically with accuracy of ± 0.01 - 0.02 %. The other impurities were determined by spectral analysis with accuracy of ± 0.001 - 0.005 %. By x-ray phase analysis it was established that compounds 1 and 2 are homogeneous and have hexagonal lattice with the following lattice parameters: a=3.104 Å, c=4.936 Å and a=3.105 Å, c=4.936 Å respectively. The conditions for the combustion of carbides with respect to tantalum and carbon were chosen to be approximately 100 %. The errors in the values for the ΔH^o of formation for(1) and ΔH^o of formation for(2) include the errors of determination of the heat of combustion of carbides, errors of the determination of ΔH^o of formation of Ta_2O_5 and ΔH^o of formation of CO_2 and the errors of the index for carbon in the carbide formulae. The calculated standard heats of formation for(1) and (2) from tantalum metal and β-graphite were: ΔH^o of formation for 1 is equal to -23.3 ± 1.0 kcal/g-formula wt. and ΔH^o of formation for 2 is equal to -25.1 ± 1.0 kcal/g-formula wt. Orig. art. has: 3 tables.

Card 2/3

ACCESSION NR: AP4033403

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University im. M.V. Lomonosov) Institut khimii Ural'skogo filiala AN SSSR (Institute of Chemistry of the Ural Branch of the Academy of Sciences SSSR)

SUBMITTED: 20Aug63

SUB CODE: IC

ENCL: 00

NR REF SOV: 012

OTHER: 003

Card 3/3

L 44723-65 EWG(j)/EWT(m)/EPF(c)/EPF(n)-2/EWG(m)/EPR/EWP(t)/EWP(b) Pr-4/
Ps-4/Pu-4 IJP(c) JD/JG

ACCESSION NR: AP5010398 UR/0226/65/000/004/0001/0008

AUTHOR: Shchetnikov, Ye. N.; Shveykin, G. P.

TITLE: Effect of gaseous-phase pressure and of the addition of high-melting metals on the nature of the intermediate products of the reduction of vanadium trioxide with carbon

SOURCE: Poroshkovaya metallurgiya, no. 4, 1965, 1-8

TOPIC TAGS: vanadium trioxide, oxycarbide phase, gaseous phase pressure, phase transition, phase homogeneity, reaction kinetics

ABSTRACT: A characteristic feature of the reduction of the oxides of high-melting metals is the formation of complex intermediate products (carbides, lower oxides, oxycarbides) with broad regions of homogeneity. Their composition determines both the mechanism and the kinetics of the reactions of this reduction. In the literature on this subject, particularly as regards V-O, V-C and V-C-O systems there still exists considerable disagreement, however, on the phase components and phase homogeneity of these systems. To clarify the picture, the authors describe the results of an experimental investigation of the kinetics of the process of reduction of

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L 44723-65

6

ACCESSION NR: AP5010398

V_2O_3 with carbon as a function of the pressure of carbon monoxide and argon, temperature, size of V_2O_3 particles, molding pressure, and addition of high-melting metals. The investigation was performed by sintering in a specially designed 100-kw laboratory furnace which permitted heating of the investigated charge both in a vacuum and in an inert gas atmosphere. The composition of the intermediate and final products was assayed by the gravimetric and volumetric methods of chemical analysis as well as by X-ray phase analysis. The effect of the gaseous phase (CO or Ar$_2$) was investigated by determining the percentage of reduction as a function of increase in temperature. It was found that the decrease in the pressure of carbon monoxide in the system contributes to the transition of the δ'-oxycarbide phase to the γ'-phase; this is also assisted by the addition of high-melting metals (Nb, Ta, Cr, Mo, W), which form a solid solution against the background of the γ'-phase. Orig. art. has: 6 figures, 3 tables.

ASSOCIATION: Institut khimii, Ural'skiy filial (Institute of Chemistry, Ural'skiy filial AN SSSR)

SUBMITTED: 13Feb64 ENCL: 00 SUB CODE: MM, IC

NO REF SOV: 013 OTHER: 002

Card 2/2 pmg

L 29520-65 EWG(j)/EWT(m)/EPF(c)/EPF(n)-2/EPR/EWP(t)/EWP(b) Pr-4/Ps-4/Pu-4
IJP(c) JD/JG

ACCESSION NR: AP5002811 S/0078/65/010/001/0302/0303

AUTHOR: Alyamovskiy, S. I.; Shveykin, G. P.; Gel'd, P. V.

TITLE: Higher niobium oxides

SOURCE: Zhurnal neorganicheskoy khimii, v. 10, no. 1, 1965, 302-303

TOPIC TAGS: niobium dioxide, niobium pentoxide, higher niobium oxide

ABSTRACT: A study of 11 samples ranging from $NbO_{2.09}$ to $NbO_{2.19}$ in gross composition was carried out with the aim of finding intermediate niobium oxides in the NbO_2-Nb_2O_5 system. An x-ray analysis with a powder camera 143.3 mm in diameter shows that the system contains not only NbO_2 and a high-temperature modification of Nb_2O_5, but also two other niobium oxides one of which is predominant in the $NbO_{2.34}$-$NbO_{2.41}$ range and the other in the $NbO_{2.45}$-$NbO_{2.48}$ range. The composition of the first is well described by the formula $NbO_{2.40}$ and of the second by the formula $NbO_{2.46}$. The system of lines on the x-ray picture of the two new niobium oxides is very similar to that of the high-temperature modification of Nb_2O_5, indicating that these three niobium oxides have a very similar structure. But the substantial displacement of the analogous lines in the small angles indicates that the new niobium oxides are of an independent nature. The distinct individuality of the new

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L 29520-65

ACCESSION NR: AP5002811

niobium oxides is confirmed by a qualitative spectral analysis. Orig. art. has: 1 figure.

ASSOCIATION: Institut khimii Ural'skogo filiala Akademii nauk SSSR (Chemistry Institute, Ural Branch, Academy of Sciences, SSSR)

SUBMITTED: 23May64 ENCL: 00 SUB CODE: IC, OP

NO REF SOV: 002 OTHER: 005

Card 2/2

L 63335-65 EPF(n)-2/EPR/EWP(k)/EWP(z)/EWT(m)/EWP(i)/EWG(m)/EWP(b)/EWP(e)/EWP(t)
Pf-4/Ps-4/Pu-4 AT/WH/JD/JG

ACCESSION NR: AP5017477 UR/0370/65/000/003/0164/0169
669.292

AUTHOR: Shveykin, G. P.; Perelyayev, V. A.

TITLE: Interaction between metallic niobium and carbon monoxide

SOURCE: AN SSSR. Izvestiya. Metally, no. 3, 164-169

TOPIC TAGS: metallic niobium, carbon monoxide, carbothermal reduction, interaction kinetics, carbide phase, oxycarbide phase, cell edge, oxycarbide film, carbon monoxide atmosphere

ABSTRACT: So far the interaction between niobium and carbon monoxide has never been investigated in detail. The authors know of only one work (Lapitskiy, A. V., et al. Zh. neorg. khimii, 1957, 2, no. 1, pp 80-90) concerned with, along with other processes, the interaction between carbon monoxide and niobium and tantalum at 1100°C, which, however, lacks any data on the nature of this interaction at elevated temperatures (1300-1900°C). Now data of this kind are greatly needed in order to elucidate the mechanism of the diffusion reaction in general as well as to clarify certain technological processes, particularly the nature of the interaction between CO and solid phases during the production of high-melting

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L 63335-65

ACCESSION NR: AP5017477

metals and carbides by means of the carbothermal reduction of their oxides. The kinetics of the interaction between specimens of powdered as well as pressed niobium and pure CO was investigated with the aid of a spring balance. The temperature in the CO-filled furnace (vacuum resistance furnace with graphite heater) was measured by means of a tungsten-molybdenum thermocouple. The interaction products were investigated by means of chemical and X-ray analysis. For powdered Nb the content of carbon and oxygen in the final products markedly decreases with increasing temperature and decreasing pressure of CO. At low temperatures a small amount of free C was found in the reaction products, whereas no free C was found at high temperatures. The cell edge of the carbide phase in most cases is much smaller than was computed on the basis of chemical analysis. This indicates the formation of, mostly, an oxycarbide phase rather than a carbide phase. For compact (pressed) niobium, by contrast, the reaction kinetics is different. At 1300°C interaction with CO proceeds slowly, and it accelerates markedly only at 1900°C. Compact niobium apparently is much more resistant to the action of CO than powdered niobium. This is attributable to the formation of a resistant film of reaction products on the surface of specimens. Such a

Card 2/4

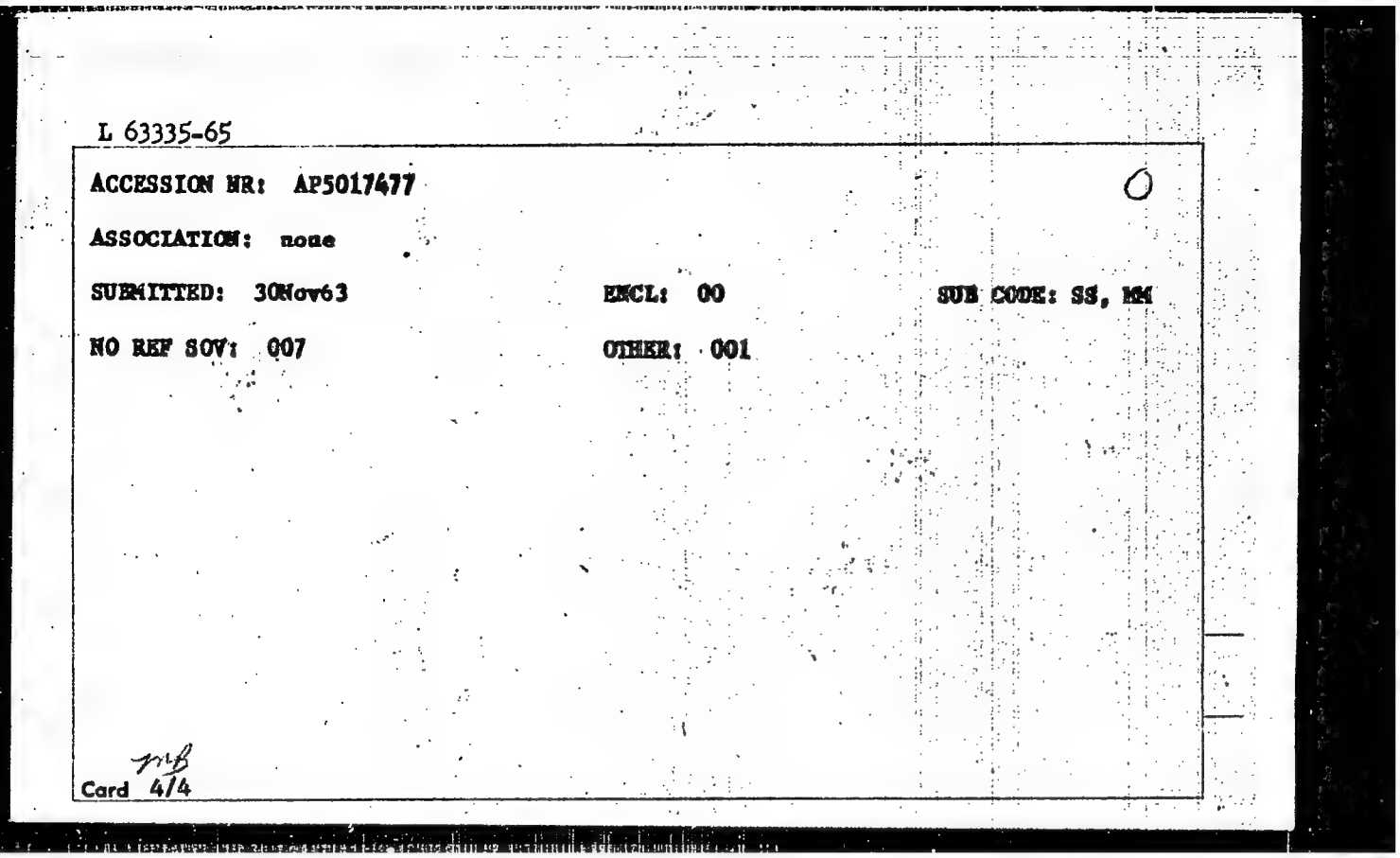
L 63335-65

ACCESSION NR: AP5017477

0

film has indeed been visually observed and its X-ray and metallographic analysis showed it to be an oxycarbide film. Specimens on which this film had formed at 1300°C (No. 1) and at 1900°C (No. 2) were again placed in the furnace and heated at 1600°C in a vacuum of $1 \cdot 10^{-3}$ mm Hg for 1 hr. Subsequent X-ray analysis showed that the surface of specimen No. 1 consisted exclusively of metallic niobium whereas specimen No. 2 contained at its surface niobium carbide with a smaller cell edge than previously (NbC_x). This warrants the assumption that niobium oxycarbide of the composition NbC_xO_y forms at the surface of compact metal and that at higher temperatures there forms a more carbon-rich oxycarbide. This is also indicated by measurements of the thermo-e.m.f. of the surface of niobium specimens exposed to a CO atmosphere for 2 hr at different temperatures: the thermo-e.m.f. increased with temperature, reaching its maximum at 1700°C. This also may be attributed to a change in the composition of the oxycarbide film: at temperatures exceeding 1700°C this composition apparently remains constant, so that the thermo-e.m.f. also remains constant. The chemical resistance of the obtained oxycarbide coatings was investigated in 40% hydrofluoric acid at room temperature and found to be higher for specimen No. 2. Thus, the oxycarbide compound of niobium displays a number of interesting physicochemical properties. Orig. art. has: 4 figures, 1 table.

Card 3/4



L 63335-65

ACCESSION NR: AP5017477

ASSOCIATION: none

SUBMITTED: 30Nov63 ENCL: 00 SUB CODE: SS, MM

NO REF SOV: 007 OTHER: 001

Card 4/4

L 10852-66 EWP(e)/EWT(m)/EPF(n)-2/EWP(t)/EWP(b) IJP(c) JD/WW/RE/GS

ACC NR: AP5025652 SOURCE CODE: UR/0080/65/038/010/2174/2181

AUTHOR: Lyubimov, V. D.; Gel'd, P. V.; Shveykin, G. P.; Alyamovskiy, S. I.

ORG: none

TITLE: Kinetics of the reduction of lower niobium oxides with carbon

SOURCE: Zhurnal prikladnoy khimii, v. 38, no. 10, 1965, 2174-2181

TOPIC TAGS: niobium compound, chemical reduction, carbon

ABSTRACT: Pressed NbO_2 + C and NbO + C powder mixtures were heated at 1200-1600°C, and the kinetics of reduction of NbO_2 and NbO were studied in a vaccum as a function of temperature, compacting pressure and presence of additives (K_2CO_3, Na_2CO_3, $CaCO_3$, TiO_2). The degree of reduction was studied as a function of temperature, time, type of carbon and amount of graphite. The reduction process was found to be complex. Under certain conditions, in addition to the usual two-stage mechanism of direct reduction, intermediate niobium carbides form. Because of its diffusive nature, the decomposition of these carbides is kinetically hindered to a considerable degree. While the initial stages of the interaction the rate-determining factor is the gasification of carbon, during the final stages the rate-determining processes involve diffusion. It is concluded that in order to accelerate the reduction, it is necessary to avoid the formation of niobium oxycarbides, e. g., by maintaining a high vacu-

UDC: 531.1+542.941+546.882

Card 1/2

L 10852-66

ACC NR: AP5025652

um in the vicinity of the reaction zones, i. e., in the microvolumes of the charge.. Orig. art. has: 6 figures, 1 table.

SUB CODE: 07/ SUBM DATE: 26Sep63/ ORIG REF: 016/ OTH REF: 003

HW

Card 2/2

ACC NR: AP6023641 SOURCE CODE: UR/0149/66/000/002/0135/0141

AUTHOR: Gel'd, P. V.; Vel'mozhnyy, E. Ya.; Lyubimov, V. D.; Shveykin, G. P.

ORG: Chair of Physics, Ural Polytechnic Institute (Ural'skiy politekhnicheskiy institut Kafedra fiziki)

TITLE: Self diffusion of niobium in some of its alloys with molybdenum

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 2, 1966, 135-141

TOPIC TAGS: niobium containing alloy, molybdenum containing alloy, activation energy, radioisotope, x ray diffraction, temperature dependence

ABSTRACT: Self diffusion coefficients (D) were obtained for niobium alloyed with 5, 10, 20, 30 and 45% Mo. The values of D were determined from radioactive tracer measurements of Nb^{95} in the form of $Nb_2^{95}O_5$. Lattice parameters were determined by the powder method and both hardnesses and microhardnesses were obtained by standard methods. The self diffusion coefficient of Nb is given as a function of Mo content for temperatures [illegible] as functions of Mo content. The relation between $\ln D_0$ and E is given by

$$\ln D_0 = -20.3 + 0.27E$$

UDC: 669.293

L 07383-67 EWT(m)/EWP(t)/ETI IJP(c) JD/WW/JW/JG
ACC NR: AP6027750 (A) SOURCE CODE: UR/0370/66/000/004/0132/0138

AUTHOR: Lyubimov, V. D. (Sverdlovsk); Gel'd, P. V. (Sverdlovsk); Shveykin, G. P. (Sverdlovsk); Vel'mozhnyy, E. Ya. (Sverdlovsk)

ORG: None

TITLE: Self-diffusion of niobium in alloys with titanium and zirconium

SOURCE: AN SSSR. Izvestiya. Metally, no. 4, 1966, 132-138

TOPIC TAGS: metal diffusion, niobium base alloy, zirconium containing alloy, titanium containing alloy

ABSTRACT: The authors study the parameters of self-diffusion of niobium in various alloys with titanium and zirconium. Unlimited series of solid solutions of niobium with β-Ti and β-Zr are formed in these systems over a wide temperature range (from approximately 1000-1100°C to the melting points). The dimensions of component atoms in alloys of niobium with titanium (as well as their lattice parameters) are extremely close (r_{Nb}=1.45 A, r_{Ti}=1.46 A). The atomic radii of the components in the Nb-Zr system differ considerably (r_{Zr}=1.6 A) so that the periods of the elementary cell are considerably dependent on composition. Thus a comparison of the characteristics of niobium alloys with β-titanium and β-zirconium is of interest from the standpoint of the

Card 1/2 UDC: 669.293.5'295'296

L 07383-67
ACC NR: AP6027750

effect which the size factor has on the diffusion mobility of niobium atoms. Homogeneous β-phase alloys were melted with various concentrations of titanium (5.0, 15.1, 29.8 and 40.9%) and zirconium (5.0, 15.1, 24.2 and 36.1%). The coefficient of self-diffusion of niobium in the solid solutions was studied by using Nb^{95} with the removal of layers and measurement of the integral radioactivity. Self-diffusion was studied as a function of alloy composition and temperature from 1400 to 1950°C. It was found that an increase in the concentration of alloying elements raises diffusion mobility while reducing the activation energy and the preexponential fact r. The addition of niobium to titanium reduces the activation energy more rapidly than in the case of Nb-Mo alloys. The activation energy in Nb-Ti alloys changes more rapidly with the preexponential factor than in Nb-Mo alloys. This is probably due to the difference between the atomic ratios of the components and the length of the elementary displacement as well as to the activation spaces produced by the impurity atoms. In spite of the considerable difference between the atomic radii of zirconium and niobium, the effect of zirconium on activation energy and preexponential factor is much weaker than that of titanium. This is apparently due to the fact that the rate of diffusion depends not only on the atomic radii but also on the potential fields and vibration frequencies of the atoms. It is shown that there is a simple linear relationship between activation energy and the logarithm of the preexponential factor. There is a regular increase in the correlation factor with the dimensions of the alloying atoms (Mo, Ti and Zr). Orig. art. has: 4 figures, 2 tables, 5 formulas.

SUB CODE: 11,07 SUBM DATE: 12Mar65/ ORIG REF: 010/ OTH REF: 003

Card 2/2

L 36445-66 EWT(m)/EWP(e)/EWP(t)/ETI IJP(c) AT/WH/WW/JW/JD/JG
ACC NR: AP6018071 (N) SOURCE CODE: UR/0076/66/040/005/1070/1076

AUTHOR: Kornilov, A. N.; Zaykin, I. D.; Skuratov, S. M.; Sheykin, G. P.

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstveny'y universitet); Institute of Chemistry, Ural Affiliate AN SSSR (Institut khimii Uralskogo filiala AN SSSR)

TITLE: Standard heats of formation of niobium carbides from the NbC phase

SOURCE: Zhurnal fizicheskoy khimii, v. 40, no. 5, 1966, 1070-1076

TOPIC TAGS: niobium compound, carbide, heat of formation, heat of combustion

ABSTRACT: Standard heats of formation (-ΔH) of niobium carbides (NbC_x; where: x = 0.838, 0.783, and 0.739) from the NbC phase were calculated on the basis of experimentally determined heats of combustion of these carbides in an oxygen stream at 1050°C. High accuracy of the -ΔH values was assured by using high purity carbide samples and by taking into account the formation (in the course of combustion) of CO_2, CO, H_2O, and solid products. The individual carbides used were homogeneous and their respective lattice parameters were: 4.458 Å for $NbC_{0.838}$, 4.454 Å for

Card 1/2 UDC: 541.11

L 36445-66

ACC NR: AP6018071

$NbC_{0.783}$; and 4.442 Å for $NbC_{0.739}$. For the series of eight samples of each carbide, the average heats of combustion (at 1050°C) were found to be: 2667.8±0.8 cal/g for $NbC_{0.838}$, 2642.1±1.5 cal/g for $NbC_{0.783}$ and 2626.2±1.3 for $NbC_{0.739}$. The calculated standard heats of formation (-ΔH) of niobium carbides from metallic niobium and β-graphite are: -30.0±0.5 kcal/g for $NbC_{0.838}$, -28.9±0.7 kcal/g for $NbC_{0.783}$, and -28.7±0.5 kcal/g for $NbC_{0.739}$. The general formula for calculating standard heats of formation of niobium carbides from NbC phase is: -ΔH formation NbC_x = 18.19+1400x kcal/g. Orig. art. has: 4 tables.

SUB CODE: 07/ SUBM DATE: 23Dec64/ ORIG REF: 012/ OTH REF: 003

Card 2/2

ACC NR: AT6036295 SOURCE CODE: UR/2768/66/000/009/0043/0050

AUTHOR: Shchetnikov, Ye. N.; Shveykin, G. P.; Gel'd, P. V.

ORG: none

TITLE: Reaction of vanadium with carbon monoxide

SOURCE: AN SSSR. Ural'skiy filial. Institut khimii. Trudy, no. 9, 1966. Fiziko-khimicheskiye issledovaniya soyedineniy redkikh tugoplavkikh elementov (Ti, V, Nb, Ta), ch. 1: Tverdofaznyye protsessy (Physicochemical analysis of compounds of rare refractory elements (Ti, V, Nb, Ta), Pt. 1: Solid-phase processes), 43-50

TOPIC TAGS: vanadium, carbon monoxide, chemical kinetics, activation energy

ABSTRACT: The kinetics of the reaction of powdered and massive vanadium with carbon monoxide were studied at various pressures and temperatures, for which the reaction rates were determined. The activation energy for both forms of vanadium was found to be 35.3 kcal/mole at 1400-1500°C. X-ray and metallographic analyses indicate that a cubic oxycarbide δ' phase (VC_xO_y) is formed on the surface of the samples, and an oxycarbide γ' phase ($V_2C_xO_y$) is located under it. This shows that the diffusion front of carbon moves faster than that of oxygen, since, if the opposite were true, an oxide phase instead of a carbide phase would be located at the metal boundary. The δ' phase accumulates on the surface of the sample in the form of a loose layer which sometimes peels off on cooling, whereas the layer of the γ' phase remains

Card 1/2

ACC NR: AT6036295

approximately stationary. It is concluded that the diffusion of carbon and oxygen and the reverse diffusion of vanadium through the γ' phase determine the kinetics of oxidation of vanadium by carbon monoxide. Orig. art. has: 6 figures, 2 tables and 1 formula.

SUB CODE: 07/ SUBM DATE: none/ ORIG REF: 009/ OTH REF: 004

Card 2/2

Call Nr: AF 1108825

Transactions of the Third All-union Mathematical Congress (Cont.) Moscow, Jun-Jul '56, Trudy '56, V. 1, Sect. Rpts., Izdatel'stvo AN SSSR, Moscow, 1956, 237 pp.

Card 56/80

AUTHOR: Shveykin, P. I. SOV/20-121-5-12/30

TITLE: Invariant Construction on an m-Dimensional Surface in n-Dimensional Affine Space (Invariantnyye postroyeniya na m-mernoy poverkhnosti v n-mernom affinnom prostranstve)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 5, pp 811-814 (USSR)

ABSTRACT: To the moving point A of the surface there is connected an arbitrary moving trihedral A, E_α ($\alpha = 1,2,\ldots,n$). The surface is given by the equation $dA = \omega^a \Lambda_a^\alpha E_\alpha$ ($a,\ldots = 1,2,\ldots,m$), where ω^α are Pfaff forms defining the group of an analytic transformation of the parametrization. The continuations of these equations lead to sequences of fields of the fundamental objects of the surface. Laptev [Ref 1] has shown that by the fields of a fundamental object of sufficiently high order, fields with an arbitrary generating object can be included. The author uses the method of Laptev for the construction and investigation of such comprehensions. The results partially were given at the Third Mathematical Union Congress in 1956. There are 3 references, 2 of which are Soviet, and 1 Dutch.

PRESENTED: April 14, 1958, by I.G.Petrovskiy, Academician

SUBMITTED: November 20, 1957

Card 1/1

SHVEYKIN, R.V.; MOKRUSHIN, S.G.

Effect of temperature on the colloid extraction kinetics by means of foam. Zhur. prikl. khim. 31 no.7:1109-1111 Jl '58. (MIRA 11:9)

1. Ural'skiy politekhnicheskiy institut imeni S.M. Kirova.
(Colloids) (Extraction (Chemistry))

SOV/109-3-10-5/12

AUTHORS: Kuz'min, V.A. and Shveykin, V.I.

TITLE: Operation of a Transistor in the Saturation Region (O rabote poluprovodnikovogo trioda v oblasti nasyshcheniya)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 10, pp 1269 - 1273 (USSR)

ABSTRACT: The saturation region in a junction transistor is defined as the operating condition in which both the emitter and the collector of the transistor have a positive bias with respect to the base. This type of operation can be observed in a simple switching circuit, such as shown in Figure 2. If a current pulse:

$$I_{э1} > \frac{-E_K}{\alpha_o R}$$

is fed into the emitter and then rapidly reduced to a value $I_{э2}$, the collector current will be practically constant for the duration of a time T; this current

Card1/5

is approximately equal to E_K/R . This phenomenon can be explained as follows: the concentration of the carriers (holes) in the base region near the collector is larger than the equilibrium value, and this results in a positive biasing of the collector junction. The flow of the holes from the base to the collector and their recombination gradually reduces the hole concentration at the collector and, after a time T reaches the equilibrium value p_n (Figure 3). The time interval T can be referred to as the storage time. An attempt is made to evaluate this time under the following assumption: 1) the behaviour of the holes in the base is described by the usual, linear diffusion equation, and it is assumed that the emitter and collector areas are equal to S ; 2) the leakage current is negligible in comparison with the diffusion current; 3) the injection coefficient γ is equal to unity for both the emitter and the collector; 4) the duration of the switching pulse τ is sufficiently large, so that the distribution of the holes in the base at the end of the pulse is independent of τ ; 5) the collector current

I_{K1} is constant during the storage time and the voltage across the collector junction is small in comparison with E_K. The problem is tackled by solving the equation:

$$\frac{\partial p}{\partial t} = D_p \frac{\partial^2 p}{\partial x^2} - \frac{p - p_n}{\tau_p} \qquad (1)$$

with the boundary conditions expressed by Eqs.(2), where q is the charge of a hole, D_p and τ_p are the diffusion coefficient and the lifetime of the holes, W is the base width, j_{E2} and j_{K1} are the current densities of the emitter and collector, respectively. At the instant of the termination of the switching pulse, the distribution $p_o(x)$ can be found from the solution of Eq.(3), which should fulfil the boundary conditions given by Eqs.(4). After a time T, the voltage at the collector junction is zero, so that the storage time can be found from the Shockley condition expressed by Eq.(5). The solution of the

Eq.(1) with the boundary conditions expressed by Eqs.(2) and the initial condition $p_o(x)$ can be represented by Eq.(6). The condition expressed by Eq.(5) can be written in the form of Eq.(7). From the above, it is found that T can be expressed by:

$$T = \tau_p \ln \frac{I_{\beta 1} - I_{\beta 2}}{\frac{I_{K1}}{\alpha} - I_{\beta 2}} \qquad (8) .$$

This is valid for $L_p^2/W^2 \gtrsim 10$. From this equation, it is possible to determine the lifetime of the holes, τ_p , from a single pulse measurement. If Eq.(8) is compared with the corresponding formula derived by Moll (Ref 2), it is found that the expressions under the logarithm are identical; the meaning of Moll's coefficient in front of the logarithm is that it represents the lifetime τ_p .

Operation of a Transistor in the Saturation Region

Eq.(8) was used to determine τ_p for a number of transistors as a function of emitter current. The results (together with the values of τ_p determined from the transient characteristics) are shown in Figures 4.

The authors express their gratitude to K.S. Rzhevkin and V.V. Migulin for their advice and help.

There are 4 figures and 3 references, 2 of which are Soviet, (1 translated from English) and 1 English.

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M.V. Lomonosova (Physics Department of Moscow State University imeni M.V. Lomonosov)

SUBMITTED: October 30, 1957

 1. Transistors--Operation

SOV/109-4-7-10/25

AUTHORS: Rzhevkin, K.S. and Shveykin, V.I.

TITLE: Saturation Regime in Junction Transistors

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 7, pp 1164 - 1172 (USSR)

ABSTRACT: The operation of transistors under the saturation condition was considered by J.L. Moll (Ref 1) and by V.A. Kuz'min and V.I. Shveykin - Ref 2). Moll determined the storage time for a transistor operating with small signals. The second work (Ref 2) was based on the analysis of the physical processes taking place in a transistor and gave a formula which permitted the determination of the storage time on the basis of one significant parameter. However, the work dealt with the problem when the input pulse applied to the transistor was infinitely long. In the following, the analysis is extended to the case of the pulses of finite duration. The analysis is carried out under the following assumptions:
1) the emitter injection coefficient is $\gamma = 1$;
2) the transistor is considered as a uni-dimensional

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system;
3) the lifetime τ of the holes in the base is constant, and
4) the electric field in the base is comparatively weak so that the drift current is much smaller than the diffusion current. The system considered is shown in Figure 2a; this is a grounded-base circuit. A pulse having a duration t_n is applied to the emitter. The output of the system at the collector is represented by Figure 3b, where t_o represents the transient and τ_p is the storage time of the transistor. By solving the diffusion equation (Eq 1) for the system it is shown that the storage time is given by:

$$t_p = \tau \ln \frac{I_{\vartheta 1} - I_{\vartheta 2} - \left(I_{\vartheta 1} - \frac{E_K}{\alpha R_H} \right) e^{-\frac{t_n - t_o}{\tau}}}{\frac{E_K}{\alpha R_H} - I_{\vartheta 2}} \qquad (2) .$$

Saturation Regime in Junction Transistors

If the input pulse is very long, the storage time is given by Eq (3); this coincides with the formulae derived in Refs 1 and 2. The storage time in a grounded-emitter circuit is given by:

$$t_{p\ni} = \tau \ln \frac{I_{\delta 1} - I_{\delta 2} - \left(I_{\delta 1} - \frac{E_K}{bR_H}\right) e^{-\frac{t_{\mu} - t_{o\ni}}{\tau}}}{\frac{E_K}{bR_H} - I_{\delta 2}} \qquad (5)$$

where $I_{\delta 1}$ is the base-current amplitude in the forward direction, $I_{\delta 2}$ is the base-current amplitude after the removal of the saturating pulse, $b = \alpha/1-\alpha$ is the current amplification coefficient, $t_{o\ni}$ is the rise time

of the output pulse (for the grounded-emitter circuit). The validity of Eqs (2) and (5) or (3) and (7) was tested experimentally. This was done by determining the lifetime τ by employing Eqs (3) and (7). The results are plotted in Figure 4, which shows the values of τ for a grounded-base circuit as a function of the emitter current. The values of τ were also determined by several other methods and these are shown in the table on p 1171 for different transistors. The first two columns in the table show τ which were measured with small signals, while the second two columns represent τ taken at large signals; the discrepancies between these values of τ amount to less than 30%. The dependence of the storage time on the duration of the input pulse is illustrated in Figure 6. It is seen that the experimental points coincide with the theoretical curves.

SOV/109-4-7-10/25

Saturation Regime in Junction Transistors

There are 6 figures, 1 table and 7 references, of which 4 are English and 3 Soviet.

SUBMITTED: March 11, 1958

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S/109/60/005/07/015/024
E140/E163

9.4310

AUTHOR: Shveykin, V.I.

TITLE: The Experimental Determination of Basic Transistor Properties by the Measurement of Minority Carrier Charge in the Base

PERIODICAL: Radiotekhnika i elektronika, Vol 5, No 7, 1960, pp 1158-1164 (USSR)

ABSTRACT: A pulse method for measuring minority carrier charge injected into a transistor base is proposed and the base charge in alloy transistors measured. In the active region this measurement permits calculating the mean transit time of minority carriers from emitter to collector which is a basic characteristic of the frequency characteristics of an ideal transistor. The charge measurement in saturation permits determining the effective lifetimes of minority carriers. It is claimed that the critical frequency (in any transistor?) is uniquely defined by Eq (7). Comparison of critical frequencies measured directly and calculated from Eq (7) on the basis of base charge measurements of Soviet transistors shows agreement within 10%. The basic condition for the proposed method of measurement is that the charge accumulation and removal take place during a time appreciably less

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S/109/60/005/07/015/024
E140/E163

The Experimental Determination of Basic Transistor Properties by the Measurement of Minority Carrier Charge in the Base

than the recombination time. Difficulties are encountered in using this method for drift transistors. It is expected that measurements of the dependence of the base charge in the active region as a function of collector voltage will permit experimental study of space-width modulation. Acknowledgements are expressed to K.S. Rzhevkin for his successful advice and to V.V. Migulin for his critical comments on the paper. There are 4 figures, 1 table and 5 references, of which 1 is English and 4 are Soviet.

ASSOCIATION: Fizicheskiy fakul'tet, Moskovskogo gosudarstvennogo universiteta imeni M.V. Lomonosova (Physics Department, Moscow State University imeni M.V. Lomonosov)

Card 2/2

SUBMITTED: October 16, 1959

4

SHVEYKIN, V.I.

Measurement of the d.c.gain coefficient at currents in excess of the limit. Radiotekh. i elektron.5 no.12:2064 D'60. (MIRA 13:11)

1. Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M.V.Lomonosova. Kafedra teorii kolebaniy.
(Transistors)

SHVEYKIN, V.I.

Pulse method for determining the parameters of drift transistors. Radiotekh.i elektron. 6 no.6:999-1009 Je '61. (MIRA 14:6)
(Transistors)

SHVEYKIN, V.I.

A new convenient parameter for classifying transistors by their response time. Radiotekhnika 17 no.11:65-67 N '62.
(MIRA 15:11)

(Transistors)

L 10246-63

ACCESSION NR: AP3001001 S/0109/63/008/006/1024/1031

AUTHOR: Shveykin, V. I. 44

TITLE: Charge method for calculating transients in driftless transistors

SOURCE: Radiotekhnika i elektronika, v. 8, no. 6, 1963, 1024-1031

TOPIC TAGS: driftless transistor, transistor transients

ABSTRACT: A charge method was formerly used for solving some particular limited problems. The article offers a mathematical substantiation and generalization of this method applied to a driftless alloy-junction transistor operating as an amplifier with a low injection level. The method is based on the law of conservation of carrier charge within the transistor and on the relations between the majority-carrier charges and the transistor currents and voltages. An allowance can be made for modulation of base-region thickness. The charge method extension covering the case of a field in the transistor base is described by the same author (Radiotekhnika i elektronika, 1963, 8, 6, 1032). Orig. art. has: 2 figures and 30 formulas.

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im.

Card 1/2/

L 10089-63 BDS

ACCESSION NR: AP3001002 S/0109/63/008/006/1032/1039

46

AUTHOR: Shveykin, V. I.

TITLE: Calculating transient processes in drift transistors by the charge method

SOURCE: Radiotekhnika i elektronika, v. 8, no. 6, 1963, 1032-1039

TOPIC TAGS: drift transistor, charge method, transistor transfer function

ABSTRACT: A method for determining transient processes in a drift transistor is given, which is based on the equilibrium of the number of moving carriers in the transistor and which relates the charges on the excess carriers to transistor currents and voltages. Examples given establish the relation between base charge Q sub b(t) and complex collector current I* sub K(t) and between Q sub b(t) and the concentration of holes at the base-emitter junction, P sub e(t). The method is also used to define the frequency dependence of the emitter transfer function and of the collector transfer function for the case of a common emitter connection. The method is approximate and makes the simplifying assumptions that the base region is

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L 10089-63

ACCESSION NR: AP3001002

uniform and that the period of any applied signal is not less than the transit time of a carrier across the base. Among the advantages cited for the charge method are that 1) all basic transistor functions can be accounted for in relatively simple continuous integral expressions and 2) no equivalent circuit is needed for analysis. "The author considers it his pleasant duty to express his profound gratitude to K. S. Rzhevkin for his valuable consultation and attention to the project and also to V. V. Migulin, E. I. Adirovich, V. M. Tuchkevich, V. I. Stafeyev, A. I. Uvarov, I. P. Stepanenko, and B. N. Kononov for all their helpful observations." Orig. art. has: 2 figures and 33 formulas.

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova. Kafedra teorii kolebaniy (Physics Faculty, Moscow State University. Department of Oscillation Theory)

SUBMITTED: 13Jun62 DATE ACQ: 01Jul63 ENCL: 00

SUB CODE: 00 NO REF SOV: 007 OTHER: 005

Card 2/2

L 8122-66 EWT(d)/EWT(l)/EWA(h) IJP(c) GG

ACCESSION NR: AP5027634 UR/0109/65/010/011/2085/2086
538.561:537.312.62

44, 55

AUTHOR: Shveykin, V. I.

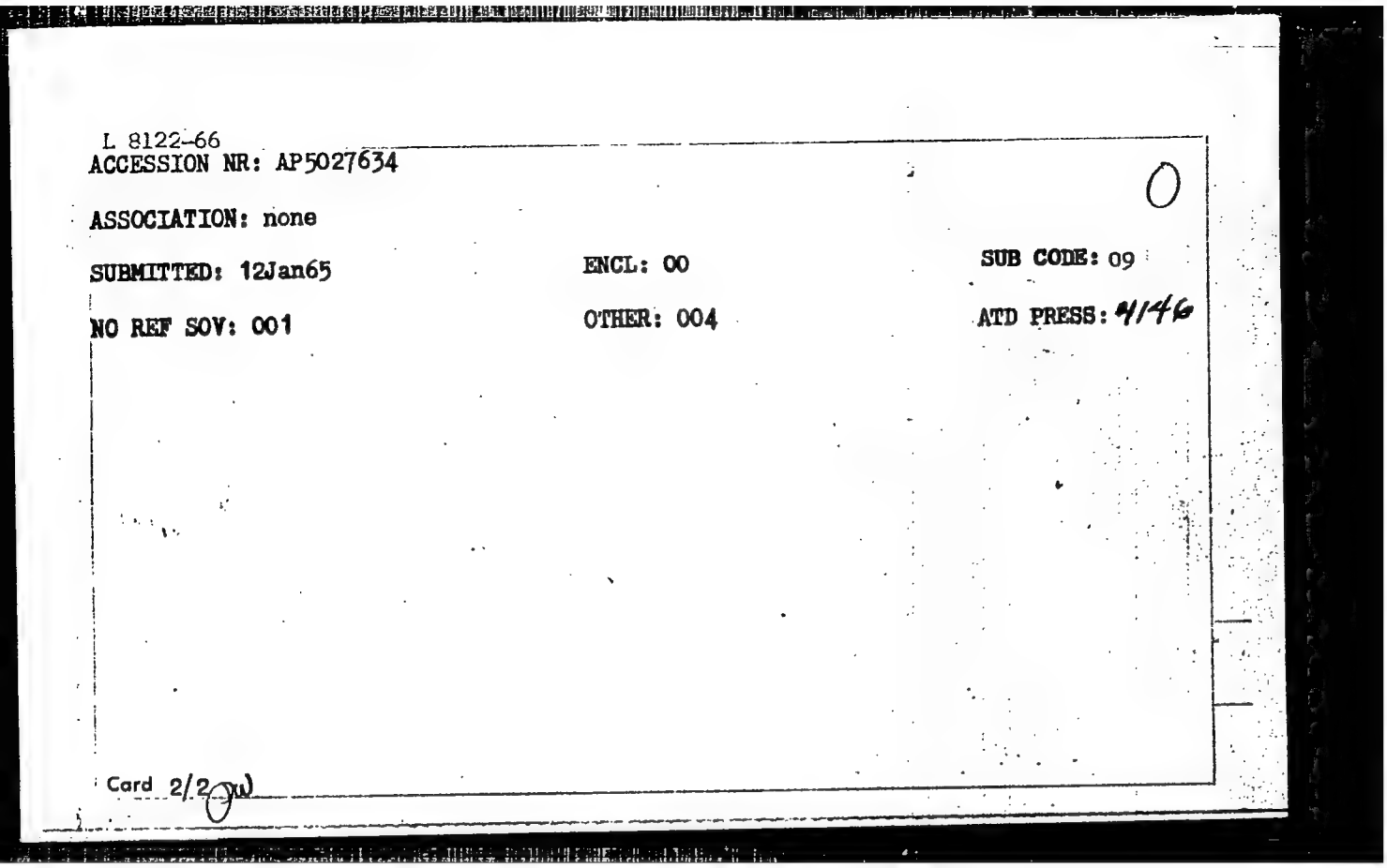
TITLE: Possibility of generating submillimeter waves by using the phenomenon of superconductivity

SOURCE: Radiotekhnika i elektronika, v. 10, no. 11, 1965, 2085-2086

TOPIC TAGS: submillimeter wave, superconductivity, ELECTROMAGNETIC WAVE GENERATION

ABSTRACT: Since the transition of electrons from their superconductive state to their normal state is associated with absorption of a certain amount of energy (Phys. Rev. Letters, 1961, 6, 92), it is suggested that a sufficient number of normal electrons be produced in a metal kept at a lower-than-superconducting temperature and simultaneously be removed from the metal. These specific methods are mentioned: 1) Passing a current (from a battery) through an M-S-M structure, where M is a normal metal and S is a superconductor, and 2) passing a current through an $M-S_2-S_1-S_2-M$ structure, where S_2 is a superconductor with a larger energy gap than that of S_1. A Fabry-Perot resonator might help in catching the submillimeter-wave oscillations. Orig. art. has: 2 figures and 1 table. [03]

Card 1/1



L 8122-66
ACCESSION NR: AP5027634

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ASSOCIATION: none

SUBMITTED: 12Jan65 ENCL: 00 SUB CODE: 09

NO REF SOV: 001 OTHER: 004 ATD PRESS: 4146

Card 2/2 gw

ACC NR: AP6021951 (A) SOURCE CODE: UR/0188/66/000/002/0118/0120

AUTHOR: Logginov, A. S.; Kurylev, V. V.; Shveykin, V. I.

ORG: Department of Oscillation Physics (Kafedra fiziki kolebaniy)

TITLE: Nonstationary thermal processes in gallium arsenide semiconductor lasers

SOURCE: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 2, 1966, 118-120

TOPIC TAGS: gallium arsenide, semiconductor laser, thermal process, pn junction, thermal conduction

ABSTRACT: Inasmuch as the temperature of the p-n junction in a solid-state laser is an important factor determining laser operation, the authors propose a new method of determining the p-n junction temperature, based on the dependence of the threshold current on the temperature ($I_{thr} = kT^3$). The method makes it possible to measure the junction temperature in the coherent and spontaneous emission modes. It consists of passing a pair of pulses through the laser diode, spaced sufficiently long to permit thermal relaxation of the diode. The second pulse is of short duration and adjustable amplitude. By varying the amplitude of the second pulse it is possible to find the generation threshold for it and to determine the pn junction temperature. By varying the delay time between the working pulse and the measuring pulse, it is possible to

UDC: 621.378.325

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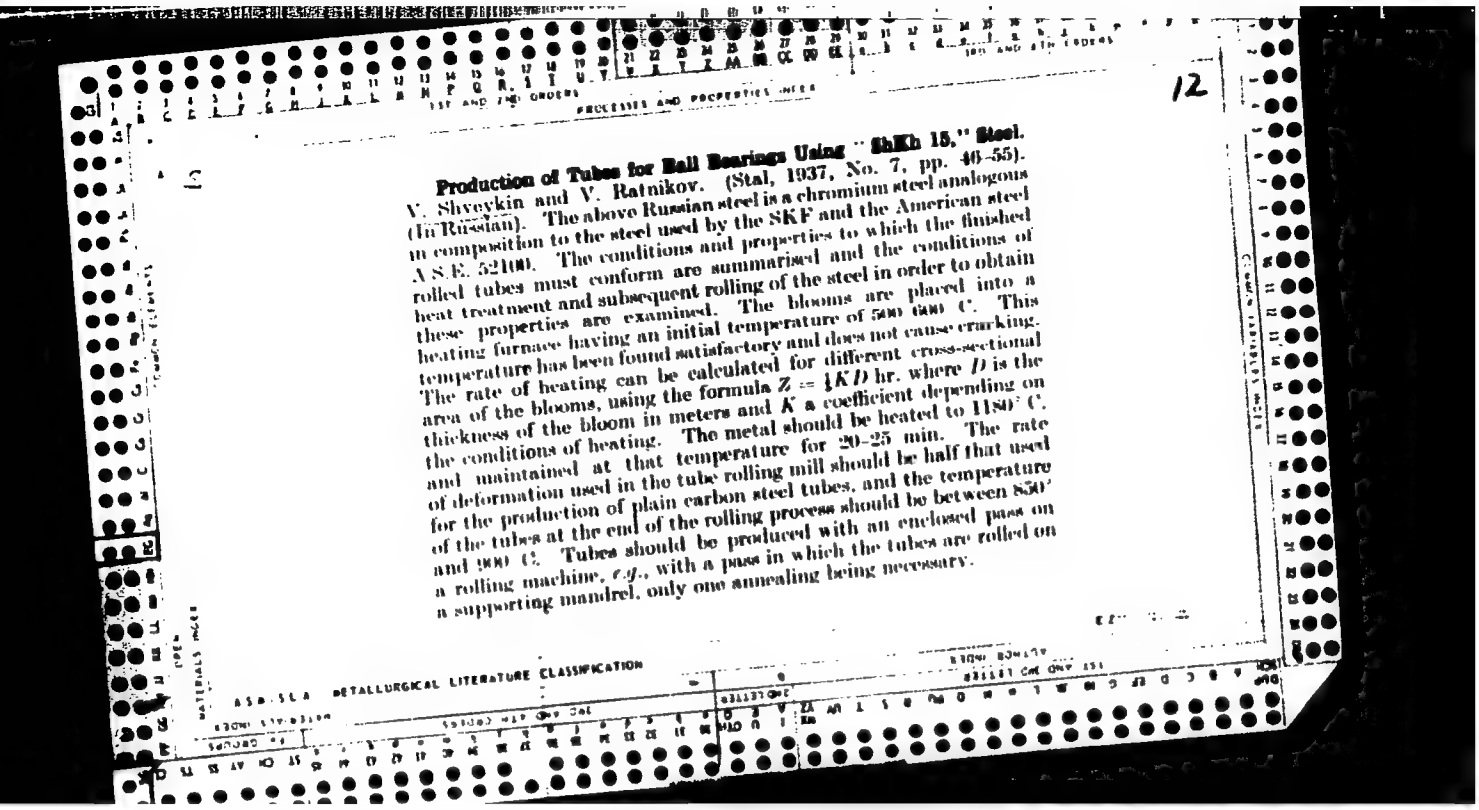
ACC NR: AP6021951

determine the cooling time of the laser diode and plot the cooling as a function of the time. Test results are presented for GaAs n-type diodes (carrier density 2 x 10^{18} cm^{-3}) of two different constructions. A theoretical analysis of the junction heating under certain assumptions, based on solution of the inhomogeneous one-dimensional thermal conductivity equation under suitable boundary conditions in a linear approximation, yielded an anlytic expression for the p-n junction temperature as a function of the duration of the working pulse for a definite pulse amplitude. The expression is in fair agreement with the experimental results. The authors thank K. Ya. Senatorov for valuable remarks and help with the work, and V. P. Durayev for preparing the diodes. Orig. art. has: 3 figures and 2 formulas.

SUB CODE: 20/ SUBM DATE: 21Oct65/ ORIG REF: 000/ OTH REF: 005

Card 2/2



Production of Tubes for Ball Bearings Using "ShKh 15," Steel. V. Shvetykin and V. Ratnikov. (Stal, 1937, No. 7, pp. 46–55). (In Russian). The above Russian steel is a chromium steel analogous in composition to the steel used by the SKF and the American steel A.S.E. 52100. The conditions and properties to which the finished rolled tubes must conform are summarised and the conditions of heat treatment and subsequent rolling of the steel in order to obtain these properties are examined. The blooms are placed into a heating furnace having an initial temperature of 500 to 600° C. This temperature has been found satisfactory and does not cause cracking. The rate of heating can be calculated for different cross-sectional area of the blooms, using the formula $Z = \frac{1}{4}KD$ hr. where D is the thickness of the bloom in meters and K a coefficient depending on the conditions of heating. The metal should be heated to 1180° C. and maintained at that temperature for 20–25 min. The rate of deformation used in the tube rolling mill should be half that used for the production of plain carbon steel tubes, and the temperature of the tubes at the end of the rolling process should be between 850° and 900° C. Tubes should be produced with an enclosed pass on a rolling machine, *e.g.*, with a pass in which the tubes are rolled on a supporting mandrel, only one annealing being necessary.

SHVEYKIN, V. I.

Mbr., Ural Polytechnic Inst., -c1948-.

Cand. Technical Sci.

"The effect of rigid ends on the deformation of sleeve pipes in a round gauge," Stal', No. 9, 1948

Shveykin, V. V.

"Investigation of the Curves of Hardening in Cold and Hot Deformation", Sbornik Trudov, Ural'skiy Politekhnicheskiy Institut, Nr 31, 1950, Sverdlovsk.

SHVEYKIN, V.V., kandidat tekhnicheskikh nauk.

Determining the surface projection area of pipes being in contact with the rolls of automatic mills. Trudy Ural.politekh.inst. no.45: 121-136 '53. (MLRA 9:11)

(Rolling (Metalwork)) (Pipe, Steel)

SHVEYKIN, V.V., kandidat tekhnicheskikh nauk.

Experimental investigation of mandrel resistance in automatic mills. Sbor.st.Ural.politekh.inst. no.48:39-51 '53. (MLRA 9:3)
(Rolling mills)

SHVEYKIN, V.V., kandidat tekhnicheskikh nauk.

Determination of the contact surface area of tubes and mandrels on automatic mills. Sbor.st.Ural.politekh.inst. no.48:52-56 '53.
(MLRA 9:3)

(Rolling mills)

SHVEYKIN, V.V., kand.tekhn.nauk

Pipe deformation in rolling without mandrels. Obr.met.davl. no.3:190-202 '54. (MIRA 12:10)
(Rolling (Metalwork)) (Deformations (Mechanics))

SMIRNOV, V.S., doktor tekhnicheskikh nauk, professor; ORRO, P.I., kandidat tekhnicheskikh nauk; SHVEYKIN, V.V., doktor tekhnicheskikh nauk, professor.

"Tensile forces in the cold drawing of tubes". Stal' 15 no.11:1054 N '55. (MLRA 9:1)

1.Leningradskiy politekhnicheskiy institut (for Smirnov).
2.Vsesoyuznyy nauchno-issledovatel'skiy trubnyy institut (for Orro)
3.Ural'skiy politekhnicheskiy institut (for Shveykin)
(Pipe) (Metal drawing) (Strains and stresses) (Al'shevskii, L.E.)

SHVEYKIN, Viktor Vasil'yevich, professor; TYAGUNOV, Vladimir Arkad'yevich, dotsent; GERMANOV, N.A., redaktor; KEL'NIK, V.P., redaktor; KOVALENKO, N.I., tekhnicheskiy redaktor.

[Technology of rolling] Tekhnologia prokatnogo proizvodstva. Sverdlovsk, Gos.nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, Sverdlovskoe otd-nie, 1956. 444 p. (MLRA 9:6)
(Rolling (Metalwork))

AUTHORS: Shveykin, V. V. Dr.ofTech.Sc., Professor. Karpenko, L.N. Eng. (Ural Polytechnical Inst., and Chelyabinskiy Tube Works).

TITLE: An improvement of the technology of rolling tubes from ingots. (Uluchsheniye tekhnologii prokatki trub iz slitkov).

PERIODICAL: "Stal'" (Steel), 1957, No.4, pp.340-342 (U.S.S.R.)

ABSTRACT: Improvements in the production of tubes were obtained by using polyhedral ingots instead of round ones and by the application of a new profile of the piercing mill rolls (double bevelled grooving, Fig.2b) and of a new mandrel. Casting of polyhedral ingots (27 and 19 faces, Fig.1) decreased the frequency of appearance of longitudinal cracks (in 5 months the number of ingots for 16" tubes with cracks decreased 2.2 times). A comparison of the output of 14" and 16" tubes, time taken for piercing and average load on the motor during piercing with the new and previous profiles of the piercing mill rolls is given. The wear of rolls with the new profile decreased by a factor of two. There are 3 diagrams.

SOV/163-58-1-23/53

AUTHOR: Shveykin, V. V.

TITLE: The Gripping of Screw-Steel by the Rolls (K voprosu zakhvata valkami v stane vintovoy prokatki)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 1, pp 122-126 (USSR)

ABSTRACT: In the present paper the dependence of the gripping capacity on the angle of inclination between the roll and the axis of the roll was investigated.
The gripping angles in increasing and decreasing roll diameters are important factors in the gripping during the rolling process. Also the cone angles are taken into account in gripping.
The dependence of the parametric angles in rolling is represented by the following formula:

$$\sin\frac{\alpha_3}{2} = \sqrt{\frac{\operatorname{tg}\varphi}{R_i \sin^2\beta}}$$

The analysis of the formula (3) shows that at a constant angle of inclination of the roll β the gripping angle α decreases according to the decrease of the cone angle. At a constant cone angle and an increase of the inclination angle β of the roll

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the gripping angle α also decreases.
From this formula may be seen that the increase of the angle of inclination of the roll promotes the rolling processes.
There are 6 figures and 6 tables.

ASSOCIATION: Ural'skiy politekhnicheskiy institut (Ural Polytechnical Institute)

SUBMITTED: October 4, 1957

AUTHORS: Shveykin, V. V., Gun, G. Ya. SOV/163-58-1-26/53

TITLE: On the Change of the Wall-Thickness of Tubes in Reduction (Ob izmenenii tolshchiny stenki truby pri redutsirovanii)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 1, pp 140-145 (USSR)

ABSTRACT: In the present investigation the change of the wall-thickness of tubes is theoretically determined (without determining the moments). The following formulae for the determination of the wall-thickness of the tubes prior to rolling, and of the wall-thickness after rolling were suggested:

$$S_o = S_k \left(\frac{d_o}{d_k}\right)^{-A} \quad (18); \qquad S_k = S_o \left(\frac{d_o}{d_k}\right)^{A} \quad (19).$$

The results obtained in the calculation of S_o and S_k agree with the values obtained experimentally.
By means of these formulae the wall-thickness desired prior to and after reduction may be calculated, thus saving unnecessary work. (Reduction in this sense means rolling without

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On the Change of the Wall-Thickness of Tubes in Reduction

any straightening device).
There are 1 figure, 1 table, and 3 references, 3 of which are Soviet.

ASSOCIATION: Ural'skiy politekhnicheskiy institut (Ural Polytechnical Institute)

SUBMITTED: October 4, 1957

AUTHORS: Chvorkin, V. V., Gun, G. Ya. SOV/163-58-2-29/46

TITLE: The Specific Pressure in Stamping of Pipes Without Frames (Udel'noye davleniye pri prokatke truby bez opravki)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 2, pp 167-169 (USSR)

ABSTRACT: The equation for the determination of the specific pressure in the stamping of pipes without frames was suggested:

$$p = \sigma_s \left(\frac{S_o}{d_o} + \frac{S_k}{d_k} \right), \qquad (11)$$

where σ_s denotes the flow limit, S - the wall thickness of the pipe, and S_o - the initial wall thickness.

By means of this formula the specific pressure was determined and then it was compared with the values found experimentally by Ya. L. Vatkin. From the values given in the table may be seen that the results agree well. The table was compiled under the consideration of the following parameters:

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The Specific Pressure in Stamping of Pipes Without Frames

SOV/163-58-2-29/46

Diameter of the roll D= 260 mm, length of the roll L = 350 mm, l_k = 55 mm, Θ = 30°. Room temperature and 1050°C were employed by the authors.

The determinations by means of the formula mentioned above are the more accurate the thinner the wall of the pipe is. There are 1 figure, 1 table, and 2 references, 2 of which are Soviet.

ASSOCIATION: Ural'skiy politekhnicheskiy institut(Ural Polytechnical Institute)

SUBMITTED: October 1, 1957

Card 2/2

SHVEYKIN, V.V., doktor tekhn.nauk, prof.; ORLOV, S.I., inzh.

Distribution of plastic deformation in transverse swaging of cylindrical shapes. Izv.vys.ucheb.zav.; chern.met. no.6:99-108 Je '58. (MIRA 12:8)

1. Ural'skiy politekhnicheskiy institut. Rekomendovano kafedroy obrabotki metallov davleniyem Ural'skogo politekhnicheskogo instituta.

(Deformations (Mechanics)) (Forging)

KOLMOGOROV, V.L.; SHVEYKIN, V.V.

Obtaining a gap between pipe and mandrel during rolling on continuous mills. Trudy Ural.politekh.inst. 73:207-215 '58. (MIRA 12:8)

(Rolling (Metalwork))

KOLMOGOROV, V.L.; SHVEYKIN, V.V.

Calculating deformations, force and the average specific pressure in strip rolling on smooth rolls. Trudy Ural. politekh.inst. 73:216-231 '58. (MIRA 12:8)
(Rolling (Metalwork))

KOLMOGOROV, V.L.; SHVEYKIN, V.V.

Calculating deformations, force and the average specific pressure in pipe rolling on long mandrels. Trudy Ural. politekh.inst. 73:232-245 '58. (MIRA 12:8)
(Rolling (Metalwork))